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The Mineral Industry of Saudi Arabia

UNITED STATES DEPARTMENT OF THE INTERIOR

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The Mineral Industry of Saudi Arabia

By Michael D. Fenton[1]

The Saudi Arabian economy continued to rely heavily on income from exports of oil and oil-based products. However, the country's recession continued for the fifth straight year in 1987 as a result of the combined effects of relatively low oil prices and decreased production, the declining value of the dollar, the Iran-Iraq war, and the global stock market crash. Rising oil prices in 1987 stimulated a slight increase in total gross domestic product (GDP) to about $70 billion, but the GDP was still down 50% from its 1981 level. Government spending had decreased by about 50% while total revenues had fallen by more than 75% since 1981. Persistant budget deficits continued to be covered by dwindling official reserves that may have declined to about $65 billion. Actual government expenditures in 1987, estimated by the U.S. Embassy, Riyadh, were about $44 billion, almost $3 billion less than budgeted. Total 1987 revenues of about $27 billion were $4 billion lower than projected. Petroleum revenues in 1987 were about $17 billion. The $15.5 billion deficit was financed through a draw on official reserves. For the first time in its modern history, the Government announced plans to borrow as much as $8 billion on the bond market to help finance its 1988 budget.

Government oil policy remained constant during the year, which was a pledge to hold oil production below the production quota set by the Organization of Petroleum Exporting Countries (OPEC) and to maintain OPEC's fixed benchmark price of $18 per barrel for Arabian Light crude oil. The purpose appeared to be to generate sufficient oil revenues to meet domestic economic needs while maintaining world oil market stability.

The Government began a major reorganization of the oil industry to increase efficiency and lower costs to cope with declining revenues. The state-owned minerals and refining agency, Petromin, was to be replaced by a company that would report directly to the Supreme Petroleum Council, the top decisionmaking agency. The Arabian-American Oil Co. (Aramco) also would be affected by this reorganization. However, by yearend, no structural changes had been made.

Saudi Arabia had the largest crude oil reserves in the world, more than one-fourth of the world's known oil reserves and about one-third of the known reserves in the market economy countries. The official estimate of the proven recoverable reserves of oil in mid-1986 was 169 billion barrels, and Aramco reported recoverable reserves at the end of 1987 of 167.4 billion barrels. Total recoverable reserves may reach 300 billion barrels through the use of enhanced recovery techniques. These reserves were expected to last over 115 years at current production rates.

Saudi Arabian natural gas reserves were the sixth largest in the world at 146 trillion cubic feet.

PRODUCTION AND TRADE

About 18% of net petroleum imports to the United States came from the Persian Gulf region in 1987; Saudi Arabia, as the world's leading exporter of petroleum, was

the United States third largest supplier. This country had been the leading supplier to the United States of crude oil and petroleum products between 1976 and 1981 when it was replaced by Mexico in 1982-85 and by Canada in 1986-87. Saudi Arabia supplied 11% of total U.S. petroleum imports. U.S. imports from Saudi Arabia in 1987, which consisted almost entirely of crude oils, gasoline, and distillate fuel oil were valued at $4.9 billion. The United States had a trade deficit with Saudi Arabia of $1.8 billion, after many years of a large trade surplus. Sales of petrochemicals to the United States declined significantly, while no exports were made of iron or steel products.

The year began with Aramco producing only an average of 3.7 million barrels per day (bbl/d) between January 1 and January 27, compared with the previous month's average of 5 million bbl/d. The OPEC production quota for Saudi Arabia at that time was 4,133,000 bbl/d, and the Government had stated that it would increase production only if demand rose and the increase was approved by OPEC. It would also adhere to a policy of making sales based on undiscounted, fixed, official Government prices. Shortly thereafter, 1-year contracts at official prices were agreed to by the four former Aramco partners (Exxon Corp., Mobil Corp., Chevron Corp., and Texaco), who would lift 1.3 million bbl/d between February and June 1987 and make adjustments thereafter. Aramco had earlier resisted fixed-price, long-term contracts because the agreed-upon price of $17.52 per barrel for Arabian Light might be more than prevailing market rates. The new contracts, however, allowed companies to underlift without penalty. As might have been expected, the Aramco partners exercised their right to underlift by taking only 700,000 bbl/d in February. Aramco's production declined to about 3.8 million bbl/d in February and 3.2 million bbl/d in March, but perhaps as much as 200,000 bbl/d was being put into floating storage for a lack of buyers. The low point was 2.4 million bbl/d during the first week of March, which was the lowest production since August 1985 when production was about 2 million bbl/d. This was a clear demonstration of the Government's support of OPEC policy.

Oil production in the first quarter of 1987 averaged 3.6 million bbl/d, compared with the fourth-quarter 1986 average of 4.9 million bbl/d. With the increase in the OPEC quota to 4,343,000 bbl/d in June, demand for Saudi oil exceeded supply in June, and nominations for July and August were very high. Production rose to about 4.5 million bbl/d in July and 4.7 million bbl/d in August, but it fell to 4.2 million bbl/d in early November as on-land storage facilities in Bonaire, Netherlands Antilles, and Rotterdam, Netherlands, were replenished and floating oil stocks were eliminated. Liftings by Aramco partners reached a high of 1.4 million bbl/d, but actual liftings in November were less than their nominations. Although the partners were buying discounted oil from Iran, Kuwait, Oman, Qatar, and the United Emirates, Saudi Arabia continued to refuse to offer discounts.

Jeddah Oil Refinery Co. reported 1987 production of 62.5 million barrels of petroleum products and a net profit of $8.8 million, slightly less than its 1986 profit of $8.9 million. Sales increased by 7.2% to $586.7 million. The Ras Tanura refinery processed 380,820 bbl/d of oil, compared with 390,251 bbl/d in 1986. Petromin Lubricating Oil Co. (Petrolube) reported a $5.4 million net profit during the 6 months ending June 30, slightly higher than profits during the first half of 1986. Sales increased by 10.4% to $46.7 million.

The Saudi Basic Industries Corp. (SABIC) reported 1987 revenues of $2.12 billion, more than double the 1986 figure of $990 million. Profits for 1987 were $267 million, compared with $64.8 million in 1986. SABIC sold 8.2 million tons of chemicals, fertilizers, metal products, petrochemicals, and plastic resins. Sales in 1986 and 1985 were 7.3 million tons and 4.96 million tons, respectively. SABIC's affiliated manufacturing plants produced 9.8 million tons of products in 1987, compared with 7.6 million tons in 1986. The rise in sales revenues was attributed to increased prices and greater efficiency.

SABIC increased the combined production capacities of 8 of its 14 plants by 1,069,000 tons per year (tpy) to 9,216,000 tpy. Production had surpassed nominal capacity of these industrial mineral plants substantially during the previous 2 years, and the increase was an indication of SABIC's success in selling its products locally and overseas, particularly in the Far East. Ethylene output increased the most, by 314,000 tpy, to a total annual production capacity of nearly 2 million tpy. Polyethylene output was the second largest increase, to 902,000 tpy, an increase of 202,000 tpy. The plants, their products, effective capacities, and capacity increases are shown in table 1.

Table 1.—Saudi Arabia: Petrochemical plants of Saudi Basic Industries Corp.

Plants	Product	Effective capacity (tons per year)	Capacity increase in 1987 (percent)
Saudi Methanol Co. (Ar Razi)	Methanol	640,000	7
National Methanol Co. (Ibn Sina)	do	770,000	10
Saudi Petrochemical Co. (Sadaf)	Ethylene	760,000	16
Do	Ethylene dichloride	560,000	23
Do	Styrene	360,000	22
Do	Crude industrial ethanol.	300,000	7
Do	Caustic soda	450,000	19
Al-Jubail Petrochemical Co. (Kemya)	Polyethylene	332,000	23
Saudi Yanbu Petrochemical Co. (Yanpet)	Ethylene	560,000	12
Do	Ethylene glycol	250,000	25
Do	Polyethylene	430,000	43
Eastern Petrochemical Co. (Sharq)	do	140,000	8
Do	Ethylene glycol	556,000	17
Arabian Petrochemical Co. (Petrokemya)	Ethylene	650,000	30
Al-Jubail Fertilizer Co. (Samad)	Urea	600,000	20

Saudi Arabia produced a record high 635,500 tons of nitrogen (N) in ammonia, significantly more than the 466,700 tons produced in 1986. Although 1987 ammonia exports were unreported, they were expected to exceed the previous year's figure of 182,700 tons N. Urea production by Saudi Arabian Fertilizer Co. (SAFCO) in Damman and Al-Jubail Fertilizer Co. (Samad) in Jubail also increased from 440,100 tons N in 1986 to 449,100 tons N in 1987. SAFCO recorded net earnings of $34.1 million for 1987, up 2.4%, as urea production increased to 343,000 tons from 330,000 tons in 1986. However, total exports declined during this period from 373,800 tons N to 246,100 tons N. Reasons for this decline were the gulf war, which inhibited shipments to Asia and the Middle East, the absence of India from the marketplace, and increased competition from U.S. producers. Buyers from Western Europe and the United States increased in importance, however.

Table 2.—Saudi Arabia: Production of mineral commodities[1]

Commodity	1983	1984	1985	1986[p]	1987[e]
Cement, hydraulic thousand metric tons	8,126	7,150	8,300	9,190	9,200
Gas, natural:[2]					
Gross million cubic feet	950,000	1,025,900	1,133,000	[e]1,341,000	1,120,000
Marketed[e] do	154,700	252,500	716,000	[3]847,600	708,000
Gypsum thousand metric tons	[r]311	[r]369	410	373	373
Iron and steel: Metal: Steel, crude do	400	842	1,106	[e]1,100	1,100
Lime[e] do	[3]9	[3]12	12	12	12
Natural gas liquids, all forms[2] thousand 42-gallon barrels	118,625	124,100	123,370	149,650	[3]118,625
Nitrogen: N content of ammonia thousand metric tons	293	415	436	467	[3]637
Petroleum:[2]					
Crude thousand 42-gallon barrels	1,657,100	1,701,995	1,236,620	1,841,425	[3]1,535,555
Refinery products:[e]					
Gasoline do	36,700	37,000	[3]49,000	49,000	67,000
Jet fuel do	17,000	17,000	[3]4,100	4,100	7,600
Kerosene do	12,100	12,000	[3]10,300	10,300	14,000
Distillate fuel oil do	68,700	68,700	[3]86,900	86,900	119,000
Residual fuel oil do	92,600	92,600	[3]87,200	87,200	119,300
Unspecified do	77,800	83,200	[3]111,300	111,300	152,300
Refinery fuel and losses do	9,000	10,000	14,000	14,000	19,200
Total do	313,900	320,560	362,800	362,800	496,400
Sulfur: Byproduct, all sources thousand metric tons	[r]793	833	1,068	1,446	1,200

[e]Estimated. [p]Preliminary. [r]Revised.
[1]Table includes data available through Sept. 9, 1988.
[2]Includes Saudi one-half share of production in the Kuwait-Saudi Arabia Divided Zone.
[3]Reported figure.

COMMODITY REVIEW

METALS

Gold.—Boliden AB, the Swedish mining, metals, and chemicals group, signed a temporary management contract with Petromin to develop the Mahd adh Dhahab gold mine, 170 miles northeast of Jeddah. At yearend, Petromin invited international companies to prequalify for a technical assistance and management contract that would run for 12 to 36 months. Petromin had canceled the supervision and construction contracts held by Gold Fields Mahd adh Dhahab in February, 1 year early, and Gold Fields was claiming more than $3 million in compensation. Gold production was expected to begin in April 1988. Annual sulfide ore production of about 120,000 tons was expected to contain 26 grams of gold and 92 grams of silver per ton. Annual production of about 8,500 tons of copper, gold, silver, and zinc concentrates were to be exported for further treatment, perhaps to Boliden's precious metals smelter in Roennskaer, Sweden.

A license for the Al-Amar gold mine, 200 kilometers southwest of Riyadh, was expected to be awarded by early 1988. The Australian-owned BHP-Utah International Inc., based in San Francisco, was the leading contender for the license. Drilling outlined a north vein deposit, 500 meters long, 8 meters wide, and at least 300 meters deep. It contained an estimated 1 million tons of ore graded 0.64 to 0.96 troy ounce of gold per ton.

Approval by the Council of Ministers was pending to begin mining at the Al Masane project, 150 kilometers southeast of Abha near the North Yemen border. The concession covered 50 square kilometers and had proven reserves of 9 million tons. Ore grades were 6% zinc, 2% copper, and 1.9 ounce of silver and 0.05 ounce of gold per ton. The first mine would have a capacity of 1,500 tons per day. This joint venture was between National Mining Co., owned by the royal family, and Arabian Shield Development Co., majority-owned by Saudi citizens, most of them were members of the royal family.

Iron and Steel.—Saudi Iron & Steel Co. (Hadeed) awarded a contract to Eisenbau Essen (EBE) of the Federal Republic of Germany to investigate the possibility of expanding capacity and introducing new product groups. Hadeed was considering diversifying into higher value products such as sections, seamless pipes, and flat-rolled products because of the shrinking market in Bahrain, Kuwait, Oman, Qatar, and the United Arab Emirates for rebars and wire rod. One shipment of 20,000 tons of wire rod was sent to Japan.

An agreement was reached by five of the gulf's most important financial and industrial institutions to build a seamless steel pipe factory at Jubail to supply the oil industry. The project was to include a $220 million seamless tube plant and a $50 million steel-handling unit. The partners were the Arab Industrial Investment Co. of Iraq, Gulf Investment Corp. of Kuwait, and three Saudi Arabian groups: National Industrialization Co. (NIC), SABIC, and The Arab Investment Co.

Titanium.—A license and a major loan from the Saudi Industrial Development Fund were approved by the Government for a planned $90 million, 45,000-tpy titanium dioxide plant in Yanbu. The client was the Crystal Pigment Co., the country's largest private sector chemicals company, whose shareholders were NIC; the Gulf Investment Corp. of Kuwait; the local Shairco for Trading, Industry, and Contracting; and Kerr-McGee Chemical Corp. of the United States. Rutile would be imported, but local deposits of titanium, mainly from the Yanbu area, may be developed.

INDUSTRIAL MINERALS

Cement.—Saudi Arabian cement markets continued to decline as domestic demand fell from a record high 23.8 million tons in 1983, to 13.3 million tons in 1986, and an estimated 12.5 million tons in 1987. Overcapacity in the domestic cement industry and the availability of low-cost imports caused cement prices to fall from about $70 per ton to less than $27 per ton, and local producers were forced to operate at well below their combined capacity of 14.9 million tpy, which included 400,000 tons of white cement and 14.5 million tons of portland cement. Imports were more than 4 million tons in 1986 and were expected to be at the same level in 1987. Prevailing conditions caused a heated debate between Saudi Arabia's 4 major cement importers and its 10 domestic producers over proposed 20% tariffs on foreign cement. The Government announced an investigation of alleged cement dumping on the Saudi Arabian market by suppliers in

Cyprus, Greece, Japan, the Republic of Korea, and Spain.

Fertilizer Materials.—National Chemical Fertilizer Co. (NCFO), a joint venture formed by state-owned SABIC and SABIC affiliate Safco, began operating its new 500,000-tpy anhydrous ammonia plant at Jubail 6 months ahead of schedule. The plant was to produce entirely for export by using the M. W. Kellogg Co. process. SABIC planned to install compound and phosphate fertilizer units by the end of 1989, increasing the total design capacity to 800,000 tpy.

National Chemical Fertilizer Co. (Ibn al-Baytar) began operating on August 30 its 500,000-tpy anhydrous ammonia plant at Jubail, and it produced 151,800 tons of ammonia during the remainder of the year. Meanwhile, it shortlisted five companies for a contract to build a six-unit phosphatic fertilizer complex. The $100 million project would comprise a 500,000-tpy nitrogen phosphate plant, a 200,000-tpy granulated triple super phosphate plant, a 100,000-tpy diammonium phosphate plant, a 10,000-tpy liquid fertilizer plant, and an optional 500,000-tpy granulated urea plant.

MINERAL FUELS

Petroleum.—*Production.*—The Government apparently decided to build, at a cost of $4 billion, underground storage facilities for refined products and crude oil under military bases at Dhahran, Hafr al-Batin, Riyadh, Tabuk, Taif, and Yanbu. The purpose was to develop strategic stores for use in the event of a blockade of the country. The first facility was expected to be at Yanbu and to be built by ABV Rock Group of Sweden, which was involved in planning and geological work for the project.

Aramco temporarily shut down the 150,000 bbl/d offshore Abu Safah oilfield, straddling the offshore demarcation line between Saudi Arabia and Bahrain with ownership divided 50-50 between them. Saudi Arabia agreed to give Bahrain 75,000 bbl/d to replace that which was not produced and offset potential financial hardship to Bahrain.

Refining.—Saudi Arabia appeared to be serious about implementing its new strategy of acquiring downstream refining and distribution operations abroad to secure guaranteed outlets for the country's hydrocarbons. Attock Oil Co. bought the 120,000-bbl/d Texas City refinery, and Arabian Shield Development Co. purchased an 18,500-bbl/d refinery in Silsbee, Texas. Other Saudi investors were negotiating with Crown Central Petroleum Inc.

Two planned projects were canceled or postponed indefinitely: the $40 million Petrolube-3 plant in Yanbu and the 6,000-bbl/d lube oil blending plant in Jeddah that was to have been built by Ahmad Jamjoon and Cofran Lubricants of France. Also, five of the six international companies that originally put in offers for Petromin Lubricating Oil Refining Co.'s (Luberef) second refinery, a 1.5-million-barrel-per-year plant to be built in Yanbu and worth an estimated $160 million, were invited to rebid.

Petrochemicals.—The Eastern Petrochemical Co. (Sharq), a joint venture between SABIC and a Japanese consortium led by Mitsubishi Corp. planned to increase its production by 10% by eliminating production bottlenecks in its plant in 1987. The designed annual capacity was 130,000 tons of linear low-density polyethylene and 300,000 tons of ethylene glycol.

Hydrocarbon Solvent Co. invited bids for the construction of a 70,000-tpy aromatics and aliphatics solvents plant at Yanbu. Feedstock kerosene and naphtha for the new plant, to be completed before 1989, would come from nearby refineries.

SABIC was considering a plan to double the capacity of the 640,000-tpy Saudi Methanol Co. (Ar Razi) plant in Jubail. The plant was 50%-owned by Mitsubishi Gas Chemical Co., which took one-half of the production. Remaining production went to Singapore and Western Europe.

Arabian Petrochemical Co. (Petrokemya) started production at its new 50,000-ton-per-year butene-1 unit in its Jubail petrochemical complex. Feedstock came from the nearby 500,000-tpy ethylene plant, and production moved by pipeline to SABIC's two polyethylene plants at Jubail for the production of linear low density and high density polyethylene resins. The volume of ethylene exports by Petrokemya was reduced as ethylene was used to produce butene-1.

The National Industrialization Co. gained a 10% share of the National Plastic Co. (Ibn Hayyan) in Jubail worth $11.7 million, according to the privatization plan of SABIC, which originally had an 85% share of Ibn Hayyan. The private companies, Saudi Plastic Products Co. and the Arabian Plastics Manufacturing Co., also acquired 1% and 0.6% shares, respectively. The new ownership reduced SABIC's holding to 73.4% as of September 1987. Ibn Hayyan began annual production of 300,000 tons of vinyl chloride monomer (VCM) and 200,000 tons of polyvi-

nyl chloride (PVC) in 1986. Most of the VCM was sold in the Far East, and the PVC was sold locally.

Transportation.—Aramco completed its looping project on Petroline, which extends 1,215 kilometers from the Abqaiq-Ghawar oilfields in the Eastern Province to Yanbu on the Red Sea coast. Capacity was increased to nearly 3.2 million bbl/d from the previous 1.85 million bbl/d, and full capacity of 500,000 bbl/d was consequently achieved through the Iraqi-owned Iraq Pipeline Trans Saudi Arabia 1 (IPSA-1), which carried Basrah Light oil about 630 kilometers from Iraq's southern oilfields to Petroline pump station PS-3. Aramco was considering a project that would increase capacity of Petroline to 4.8 million bbl/d by installing higher capacity pumps at a cost of $400 million. The capacity of the natural gas liquids line would also be increased from 290,000 bbl/d to 430,000 bbl/d.

Iraq awarded a contact of nearly $1.5 billion for the construction of a pipeline system, phase 2 (IPSA-2), which would link IPSA-1 at PS-3 to the new export terminal about 12 miles south of Yanbu and service tankers as large as 400,000 deadweight tons. IPSA-2, 970 kilometers of 48-inch and 56-inch pipeline, would parallel Petroline and would have a capacity of 1.6 million bbl/d, which would raise Iraq's export capacity to 3.3 million bbl/d. Recipients of the contract were Saipem S.p A. of Italy, Mitsubishi, Hyundai of the Republic of Korea, and Spie-Capag of France.

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